

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A control and regulation system of a combustion unit ~~(10)~~ of the type comprising including a combustion chamber ~~(11)~~ and a catalyst ~~(40)~~, said control and regulation system comprising:

[[-]] an acquisition device ~~of~~ configured to acquire signals proportional to functioning parameters characteristic of the functioning state of the combustion unit ~~(10)~~; _i

[[-]] an electronic data processing unit ~~(30)~~ connected to the signal acquisition device ~~from which it receives~~ and configured to receive the signals; _i

[[-]] a control and regulation program associated with said electronic data processing unit ~~(30)~~; _i

[[-]] a first fuel distribution valve ~~(20)~~ configured to fluidly connect to the combustion chamber; _i

[[-]] a second air distribution valve ~~(21)~~ configured to fluidly connect a first area of the combustion chamber to a third area of the combustion chamber; and _i

[[-]] a data base associated with said electronic data processing unit ~~(30)~~,
wherein

[[-]] said electronic data processing unit ~~(30)~~ receives the signals from the signal acquisition device, processes ~~them~~ the signals and regulates ~~the~~ an opening of the first valve ~~(20)~~ and second valve ~~(21)~~ to minimize ~~the~~ polluting emissions of CO and NOx of the combustion unit ~~(10)~~.

2. (Currently Amended) The control and regulation system of a combustion unit ~~(10)~~ according to claim 1, ~~characterized in that~~ wherein said signal-acquisition device comprises at least one sensor ~~capable of detecting~~ configured to detect at least one signal proportional to a functional parameter characteristic of the functioning state of the combustion unit ~~(10)~~.

3. (Currently Amended) The control and regulation system of a combustion unit ~~(10)~~ according to claim 1 ~~claims 1 and 2~~, ~~characterized in that~~ wherein said signal-acquisition device comprises a series of sensors ~~suitable for detecting~~ configured to detect signals proportional to parameters characteristic of the functioning state of the combustion unit ~~(10)~~.

4. (Currently Amended) The control and regulation system of a combustion unit ~~(10)~~ according to claim 3, ~~characterized in that~~ wherein said series of sensors comprises a set of temperature sensors.

5. (Currently Amended) The control and regulation system of a combustion unit (10) according to claim 1, ~~4, characterized in that said series of temperature sensors comprises wherein said acquisition device includes~~ a first set of temperature sensors (60), a second set of temperature sensors (61) and a third set of temperature sensors (62).

6. (Currently Amended) The control and regulation system of a combustion unit (10) according to claim ~~3~~, characterized in that ~~said series of sensors~~ claim 5, wherein said acquisition device comprises first pressure sensors (63) disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second pressure sensors (65) disposed downstream from a turbine connected to the combustion chamber.

7. (Currently Amended) The control and regulation system of a combustion unit (10) according to claim ~~4~~ 5, characterized in that ~~said series of temperature sensors wherein said acquisition device comprises first~~ temperature sensors (64) disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second temperature sensors (66) disposed downstream from a turbine connected to the combustion chamber.

8. (Currently Amended) The control and regulation system of a combustion unit (10)

according to ~~any of the previous claims, characterized in that~~ claim 1, wherein said combustion chamber (11) comprises ~~a~~ the first area (12), a second area (13) in which the catalyst (40) is housed, ~~a~~ the third area (14) that sandwiches with the first area the second area, a first fuel inlet duct (71) connecting said first fuel distribution valve to said first area of the combustion chamber, a second inlet duct (72) configured to transport of the air coming from ~~the~~ a compressor 50 and an outlet duct (73) of the exhaust gases that is connected to the third area of the combustion chamber.

9. (Currently Amended) The control and regulation system of a combustion unit (10) according to claim 8, ~~characterized in that~~ wherein said combustion chamber (11) comprises a third fuel inlet duct (74) configured to connect said first fuel distribution valve to an interface between the second area and the third area of the combustion chamber, an air distribution duct (75) configured to connect the first area of the combustion chamber to the third area of the combustion chamber and to be controlled by the second air distribution valve and a main fuel duct (70) connected to the first fuel distribution valve.

10. (Currently Amended) The control and regulation system of a combustion unit (10) according to claim 9, ~~characterized in that~~ wherein the main fuel duct (70) is connected to the first valve (20) which in turn is connected to the first fuel inlet duct (71) and to the third fuel inlet duct (74) to distribute the fuel in the first area (12) and the second area

~~(13)~~ of the combustion chamber ~~(11)~~.

11. (Currently Amended) The control and regulation system of a combustion unit ~~(10)~~ according to ~~claims 5 and 8, characterized in that~~ claim 5, wherein said first ~~series~~ set of temperature sensors ~~(60)~~ is positioned between the first area ~~(12)~~ and the second area ~~(13)~~ close to the catalyst ~~(40)~~.

12. (Currently Amended) The control and regulation system of a combustion unit ~~(10)~~ according to ~~claims 5 and 8, characterized in that~~ claim 5, wherein the second ~~series~~ set of temperature sensors ~~(61)~~ is positioned close to the catalyst ~~(40)~~ between the ~~a~~ second area ~~(13)~~ and the third area ~~(14)~~ of the combustion chamber ~~(11)~~.

13. (Currently Amended) The control and regulation system of a combustion unit ~~(10)~~ according to ~~claims 5 and 8, characterized in that~~ claim 5, wherein the third ~~series~~ set of temperature sensors ~~(62)~~ is positioned in the third area ~~(14)~~ of the combustion chamber ~~(11)~~.

14. (Currently Amended) The control and regulation system of a combustion unit ~~(10)~~ according to claim 8, ~~characterized in that~~ wherein said combustion unit ~~(10)~~ is connected to a compressor ~~(50)~~ and a turbine ~~(80)~~ by ~~means of~~ the second compressed air inlet duct ~~(72)~~ and by ~~means of~~ the outlet duct ~~(73)~~, respectively.

15. (New) A control and regulation system of a combustion unit including a combustion chamber and a catalyst, said control and regulation system comprising:
- an acquisition device configured to acquire signals proportional to functioning parameters characteristic of the functioning state of the combustion unit;
 - an electronic data processing unit connected to the signal acquisition device and configured to receive the signals;
 - a control and regulation program associated with said electronic data processing unit;
 - a fuel distribution valve configured to fluidly connect to the combustion chamber and regulate an amount of fuel provided to the combustion chamber;
 - an air distribution valve configured to fluidly connect a first area of the combustion chamber to a third area of the combustion chamber and to regulate an amount of air flowing to the third area from the first area outside the combustion chamber; and
 - a data base associated with said electronic data processing unit, wherein said electronic data processing unit receives the signals from the signal acquisition device, processes the signals and regulates an opening of the fuel distribution valve and the air distribution valve to minimize polluting emissions of CO and NO_x of the combustion unit based on the received signals.

16. (New) The control and regulation system of a combustion unit according to claim 15, wherein said acquisition device includes a first set of temperature sensors, a second set of temperature sensors and a third set of temperature sensors provided inside the combustion chamber.

17. (New) The control and regulation system of a combustion unit according to claim 16, wherein said acquisition device comprises first pressure sensors disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second pressure sensors disposed downstream from a turbine connected to the combustion chamber.

18. (New) The control and regulation system of a combustion unit according to claim 16, wherein said acquisition device comprises first temperature sensors disposed between a compressor configured to provide air to the combustion chamber and the combustion chamber and second temperature sensors disposed downstream from a turbine connected to the combustion chamber.

19. (New) The control and regulation system of a combustion unit according to claim 15, wherein said combustion chamber comprises the first area, a second area in which

the catalyst is housed, the third area that sandwiches with the first area the second area, a first fuel inlet duct connecting said first fuel distribution valve to said first area of the combustion chamber, a second inlet duct configured to transport the air coming from a compressor and an outlet duct of the exhaust gases that is connected to the third area of the combustion chamber.

20. (New) The control and regulation system of a combustion unit according to claim 19, wherein said combustion chamber comprises a third fuel inlet duct configured to connect said first fuel distribution valve to an interface between the second area and the third area of the combustion chamber, an air distribution duct configured to connect the first area of the combustion chamber to the third area of the combustion chamber and to be controlled by the second air distribution valve and a main fuel duct connected to the first fuel distribution valve.